HMI-201-A-1

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

Applicant:	M. Lowenstein
Serial Number:	422,360
Filed:	17 April 1995
Group Art Unit:	2104
Examiner:	S. Medley
Title:	ELECTRICAL FILTER/PROTECTOR, AND METHODS OF CONSTRUCTING AND UTILIZING SAME

BRIEF ON APPEAL UNDER 37 CFR §1.192

Box AF
Commissioner of Patents and Trademarks
Washington, D.C. 20231

Sir:

In accordance with 37 CFR §1.192, please enter the following Brief on Appeal for the above-identified application.

STATUS OF CLAIMS

The claims in the application are claims 1-15 and 17-21. Claim 16 was cancelled during prosecution of the application. As stated in the final Office Action dated 28 December 1995 (Paper No. 7), the specification was objected to and claims 17-19 were rejected under 35 USC §112, first paragraph, as allegedly failing to provide an enabling disclosure; claims 12-15 stand rejected under 35 USC §112, fourth paragraph, as allegedly being of improper dependent form for failing to further limit the subject matter of a previous claim; claims 1-11, 20 and 21 stand rejected under 35 USC §103 as allegedly being unpatentable over some acknowledged prior art in view of Stacey U.S. Patent 3,849,677 (Stacey) and Thanawala U.S. Patent 3,881,137 (Thanawala); and claims 12-15 and 17-19 are rejected under 35 USC §103 as allegedly being unpatentable over some acknowledged prior

art in view of Stacey and Thanawala as to claims 1-11, and further in view of Gilardi U.S. Patent 5,243,648 (Gilardi). Appellant appeals the objection to the specification as well as to each of the rejections to claims 1-15 and 17-21 indicated hereinabove.

STATUS OF AMENDMENTS

Amendment C was filed and entered on 28 March 1996. The amendment overcame the Examiner's final rejection to claims 11-15 under 35 USC §112, second paragraph, but allegedly failed to overcome the final rejection to claims 12-15 under 35 USC §112, fourth paragraph (Advisory Action, dated 29 April 1996).

REAL PARTY IN INTEREST

Appellant respectfully submits that he is the real party in interest of the invention disclosed and claimed in the above-identified application.

RELATED APPEALS AND INTERFERENCES

There are no other appeals or interferences known to appellant which will be directly affected by or have a bearing on the Board's decision in the present appeal.

SUMMARY OF THE INVENTION

The present invention relates to a device for optimizing the operation of a nonlinear load, and specifically to a device which substantially eliminates neutral currents in an electrical power system.

Referring to FIGS. 1-3, the present invention comprises one or more purely passive tank circuits 10 which are connected in series with one or more nonlinear loads 8 in an electrical power system. Each passive tank circuit is connected along a separate phase line of the power system, as shown in FIG. 3. The tank circuit preferably comprises a parallel combination of reactor 1, capacitor 2 and resistor 3, and is tuned to the third harmonic of the AC power source frequency (page 4, lines 23-28).

In multiple phase electrical power systems, when the fundamental currents in all three phase lines are of equal magnitude, the neutral line carries substantially no current.

However, when harmonic currents are being drawn by nonlinear loads, certain harmonic currents do not cancel in the neutral line but instead are add therein. When tuned to the third harmonic, circuit 10 substantially prevents the nonlinear load from drawing third harmonic currents, so the nonlinear load is forced to change the way in which it draws current in order to compensate for the suppression of third harmonic currents (page 6, lines 1-3 and 14-17). The resulting waveform of the current drawn by the nonlinear load, which more closely resembles the AC source frequency, does not effect the performance of the load (page 6, lines 23-26). When circuit 10 is tuned to the third harmonic of the source frequency, not only are the third harmonic currents substantially reduced in the neutral line, but also neutral currents at other harmonic frequencies (page 7, lines 3-7).

One preferred embodiment of the present invention includes a means for connecting the device to a nonlinear load located within an equipment rack. The connecting means comprises a rack panel member having a perforated portion, as shown in FIG. 7. In this way, the present invention may replace a cooling panel so as to improve system performance without sacrificing airflow and/or additional equipment rack space (page 9, lines 13-18).

Another preferred embodiment of the present invention comprises a mounting plate 41, a face plate 40 and connectors 42 (FIG. 11) for connection to the phase and neutral lines leading to the AC source (page 9, lines 19-23).

Further, another embodiment of the present invention includes a monitor saver board, which temporarily deactivates a computer monitor display following periods of inactivity, thereby saving energy by reducing current drawn by the monitor load (page 10, lines 1-9).

Another preferred embodiment of the present invention includes an isolation transformer (FIG. 14) which is connected to circuit 10, and a bracket member which allows the present invention to connect to a portable cart (page 10, lines 10-15).

Still another preferred embodiment of the present invention includes a means, connected to circuit 10, for controlling current drawn by loads such as laser printers or copying machines, comprising high current limiting circuit 80, which is connected to circuit 10; current sensor 81, which detects high peak current levels drawn from load 82 and activates current limiter 80 upon a detection thereof (FIG. 13). When load 82 is not drawing

high currents, sensor 81 switches current limiting circuit 80 from the system (page 10, lines 20-30; page 11, lines 1-14).

ISSUES

I. Is the specification in such full, clear, concise and exact terms to enable one of ordinary skill in the art to make and use the claimed invention without undue experimentation, and are claims 17-19 improperly rejected under 35 USC §112, first paragraph, as a result?

II. Are claims 12-15 improperly rejected under 35 USC §112, fourth paragraph, for failing to further limit the subject matter of a claim from which they depend?

III. Are claims 1-11, 20 and 21 improperly rejected under 35 USC §103 as being unpatentable over some alleged acknowledged art in view of Stacey and Thanawala?

IV. Are claims 12-15 and 17-19 improperly rejected under 35 USC §103 as being unpatentable over some alleged acknowledged art in view of Stacey, Thanawala and Gilardi?

GROUPING OF CLAIMS

The claims on appeal, claims 1-15 and 17-21, do not stand or fall together. Rather, each of the claims stands or falls on its own merits as understood from the arguments presented hereinbelow.

ARGUMENT

The References

One reference relied upon by the Examiner is Stacey which discloses a complex hybrid power filter which utilizes active and passive elements. One active element is a controllable generator, which generates a synthetic ripple current which offsets ripple current existing in the electrical system (column 2, lines 30-36). In one embodiment, the active element (shown in FIG. 3) is arranged in parallel with a capacitor and inductor, the parallel

combination of which is connected in series with a load so that the active element generates a ripple current with tends to offset the actual ripple current in the system.

Another reference relied upon by the Examiner is Thanawala which discloses damping circuits for suppressing parasitics associated with a voltage-compensating supply frequency capacitor, wherein the capacitor is connected in a damping circuit to provide a substantially undamped path for the capacitor current, and a damped path for other parasitic currents.

The Rejection

The specification is objected to and claims 17-19 are rejected under 35 USC §112, first paragraph, for allegedly failing to provide an enabling disclosure for the invention claimed in claims 17-19. In the opinion of the Examiner, there is no description in the specification as to "what connotes" the current limiting circuit, the current detecting circuit, and a switch, despite the fact that these circuits are admitted by the Examiner to be "well known," (Final Office Action, Paper No. 7).

Claims 12-15 are rejected under 35 USC §112, fourth paragraph, for allegedly being of improper dependent form by failing to further limit the subject matter of the claim from which they depend (Final Office Action, page 2). In the opinion of the Examiner, the invention claimed in claims 12-15 are indefinite because the features recited in claims 12-15 have little to do with a device which reduces current. Because claims 12-15 are indefinite, the Examiner maintains, a rejection under 35 USC §112, fourth paragraph is appropriate.

Claims 1-11, 20, and 21 are rejected under 35 USC §103 as allegedly being unpatentable over some acknowledged prior teachings in view of Stacey and Thanawala. According to the Examiner, Stacey teaches an active filter serially connected between the source and load, while Thanawala teaches damping circuitry within which there exists, amongst other circuitry, a resistor in parallel with a capacitor and an inductor. It would have been obvious, the Examiner asserts, to replace the active filter of Stacey with the R-L-C components located within the Thanawala circuitry.

Claims 12-15 and 17-19 are rejected under 35 USC §103 as allegedly being unpatentable over some acknowledged prior teachings in view of Stacey and Thanawala as

applied to claims 1-11, and further in view of Gilardi. In the opinion of the Examiner, Gilardi discloses a protective device having a housing and a transformer.

Appellant's Arguments

I. With regard to the Examiner's objection to the specification and rejection of claims 17-19 under 35 USC §112, first paragraph, the specification must

> . . . contain a written description of the invention . . . in such full, clear, concise, and exact terms as to enable any person skilled in the art to which it pertains . . . to make and use the same . . .

35 USC §112. "A patent need not disclose what is well known in the art." *In re Wands*, 8 USPQ.2d 1400, 1402 (CAFC 1988). Enablement is present even though some experimentation is necessary so long as it is not undue experimentation. *In re Wands*, 8 USPQ.2d at 1404. In determining what constitutes undue experimentation, one must apply the standard of reasonableness while considering the nature of the invention and the state of the art. A considerable amount of experimentation is allowable as long as it is routine. *In re Jackson*, 217 USPQ 804, 807 (BPAI 1982).

In the present case, the specification discloses an alternative embodiment of the present invention including a high current limiting circuit 80, which is connected to the harmonic current eliminating device 10; current sensor 81, which detects high peak current levels drawn from copying machine 82 and which activates the high current limiting circuit 80. The specification discloses that the high current limiting circuit 80 is automatically isolated from the device when current sensor 81 detects that a high current draw no longer exists. High current limiting circuit 81 acts to clamp the drawn current within acceptable levels, while sensor 81 detects a rapid increase in drawn current by the copying device (page 10, line 29 - page 11, line 14 of the specification).

Appellant respectfully submits that certainly one of ordinary skill in the art of electrical system design and electrical power system design would certainly know of current limiting circuits, such as a zenor diode circuit; a switch; and current sensing and/or detecting circuits, such as a comparator circuit. These types of circuits serve as the basic building blocks for complex electronic systems and are taught in entry-level electronics courses in

college.[1] Accordingly, appellant respectfully submits that assertions that ordinary persons in this field of art are unfamiliar or somehow unaware of these basic building blocks are without merit. Unquestionably, one of ordinary skill in the present art would know how to make and use the invention claimed in claims 17-19 substantially without even any routine experimentation, based upon the current limiting circuit, current detecting circuit and the switch being well known in the art.

Significantly, the Examiner concurs with this assertion, as the Examiner has continuingly held that current limiting circuits, current detecting circuits and switches are well known in the art (Final Office Action, Paper No. 7, page 4, first paragraph; and Non-final Office Action, Paper No. 3, page 7). Since both the Examiner and appellant agree that such circuits are well known, it is not necessary that the specification disclose their specific implementations. *In re Wands* 8 USPQ.2d at 1402. Accordingly, appellant respectfully requests that the Examiner's objection to the specification and rejection to claims 17-19 under 35 USC §112, first paragraph, be overturned.

II. Concerning the Examiner's rejection to claims 12-15 under 35 USC §112, fourth paragraph, the pertinent section of the statute states that

> . . . a claim in dependent form shall contain a reference to a claim previously set forth and then specify a further limitation of the subject matter claimed. A claim in dependent form shall be construed to incorporate by reference all the limitations of the claim to which it refers.

35 USC §112. In the present case, the Examiner rejects claims 12-15 under 35 USC §112, fourth paragraph, on the grounds the invention claimed therein is "wholly indefinite", (Final Office Action, Paper No. 7; Non-Final Office Action, Paper No. 3, item #4, whose rejection is maintained in Final Office Action). Appellant respectfully submits that the Examiner's grounds of rejection are altogether misplaced, because whether a claim is indefinite is not the test for determining compliance under 35 USC §112, fourth paragraph. No language in the fourth paragraph of section 112 can be reasonably interpreted as imposing a test of

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[1] It is noted, however, that the particular combination and interrelationship of such components as claimed in claims 17-19 are novel over the prior art.

indefiniteness. Not surprisingly, the Examiner has failed to cite any case in which an indefiniteness test is used to reject a claim under 35 USC §112, fourth paragraph. As a result, appellant respectfully submits that the Examiner's rejection of claims 12-15 under 35 USC §112, fourth paragraph, is without merit.

Further, the Examiner contends that claim 12, in which the connecting means comprises an equipment rack panel member which is connected to the housing member, is in improper dependent form. On the contrary, claim 11 (a claim without any rejection under 35 USC §112) properly recites a device for reducing currents having a housing member and a means for connecting the nonlinear loads to the claimed electrical components. Both the housing member and the connecting means are part of the subject matter of claim 11. Upon a careful review of claim 12, it merely further defines the connecting means recited in claim 11 and defines its structural relationship with the housing member which is also recited in claim 11. Claim 12 also incorporates by reference all the limitations of claim 11. Clearly, claim 12 fully complies with the express language of 35 USC §112, fourth paragraph. Accordingly, appellant respectfully requests that the rejection of claim 12 under 35 USC §112, fourth paragraph, be overturned.

Similarly, claim 13 incorporates all of the limitations of claim 11. Claim 13 defines the connecting means of claim 11 as comprising an electrical socket and a bracket member and defines the structural relationship between the socket, bracket member and the housing member of claim 11. Because claim 13 further defines the subject matter (the connecting means) of claim 11 and incorporates all of the limitations therein, appellant respectfully submits that claim 13 fully complies with the express language of 35 USC §112, fourth paragraph. Accordingly, appellant respectfully requests that the rejection of claim 13 under 35 USC §112, fourth paragraph, be overturned.

Claim 14 incorporates all of the limitations of claim 11. In addition, claim 14 includes a monitor saver board. Appellant respectfully submits that the primary purpose of monitor saver boards is to reduce current drawn by a load in an electrical system (page 9, line 24 through page 10, line 9 of the specification), which is precisely what the invention in claim 11 recites (noting the preamble language of claim 11 as amended in Amendment B). As a result, appellant respectfully submits that claim 14 fully complies with the express language

of 35 USC §112, fourth paragraph. Accordingly, appellant respectfully requests that the rejection to claim 14 under 35 USC §112, fourth paragraph, be overturned.

Claim 15 incorporates all of the limitations of claim 11. Claim 15 defines an isolation transformer which is electrically connected to the electrical components recited in claim 11; the connecting means of claim 11 as comprising electrical sockets and a bracket member; and the structural relationship between the sockets, bracket member and the housing member of claim 11. Because claim 15 further defines the subject matter (the connecting means) of claim 11 and incorporates all of the limitations therein, appellant respectfully submits that claim 15 fully complies with the express language of 35 USC §112, fourth paragraph. Accordingly, appellant respectfully requests that the rejection of claim 15 under 35 USC §112, fourth paragraph, be overturned.

III. With regard to the Examiner's rejection to claims 1-11 and 20-21 as allegedly being unpatentable over some acknowledged art in view of Stacey and Thanawala, appellant submits the following.

Initially, the Examiner contends that the above-mentioned acknowledged art is a teaching for filtering for a three phase system by providing a filter for each phase (Final Office Action, Paper No. 7, page 7). The Examiner contends that this alleged art is acknowledged on page 2, line 18-22 of the specification. On the contrary, the exact language of lines 18-22 of page 2 is as follows.

> Further, U.S. Patent No. 4,812,669 discloses a device for suppressing harmonic currents using a passive filter tuned to high-order harmonic frequencies and an active filter tuned to a low-order harmonic frequencies. However, the invention fails to provide a simply constructed, low power device for reducing neutral currents or third harmonic currents.

As can be clearly seen, there is no mention of devices for use in three phase electrical systems in this portion of the specification relied upon by the Examiner or any other portion thereof. Because the acknowledged art fails to disclose any teaching which the Examiner contends to exist and relies upon in rejecting claims 1-11 and 20-21, appellant respectfully submits that the proposed combination of teachings is improper.

Appellant respectfully submits that no reference cited by the Examiner discloses,

teaches or even remotely suggests a device for substantially eliminating neutral currents in a multiple phase electrical power system, as recited in claims 1-6. As stated in *In re Nomiya*, 184 USPQ 607, 612 (CCPA 1975),

> [Where] there is no evidence of record that a person of ordinary skill in the art at the time of [an applicant's] invention would have expected [a problem], . . . it is not proper to conclude than [an invention], which solves this problem . . . would have been obvious to that hypothetical person of ordinary skill in the art.

Here, no reference cited by the Examiner discloses the application of a device which is tuned to a harmonic frequency of an AC power supply in substantially addressing the problem of increased neutral currents in multiple phase electrical systems. No reference cited by the Examiner even discusses problems associated with multiple phase electrical systems. In the absence of any disclosure of a problem pertaining to neutral currents or of a device for reducing neutral currents in a multiple-phase electrical power system, appellant respectfully submits that the specific device claimed in claims 1-6 are distinct and nonobvious over the Examiner's proposed combinations.

Regarding the Examiner's proposed combination of Stacey and Thanawala teachings, it is impermissible to extract from a reference

> only so much of it as will support a given position, to the exclusion of other parts necessary to the full appreciation of what such reference fairly suggests to one of ordinary skill in the art.

In re Wesslau, 147 USPQ 391 (CCPA 1965). With respect to the combination of Stacey with Thanawala, the Examiner has extracted series connected passive components of Stacey to the exclusion of the active components (the controllable generator circuitry) which are entirely necessary to the full appreciation of what Stacey fairly suggests to an ordinary artisan, i.e., a hybrid device for actually generating synthetic ripple currents which oppose and eliminate residual ripple in an electrical system. In the Final Office Action, the Examiner fails to provide any rationale as to how the primary component of Stacey may be precluded from any consideration while other components are extracted therefrom in forming a basis of rejection under 35 USC §103. As a result, appellant respectfully submits that the Examiner has improperly extracted teachings from Stacey to the preclusion of components which are necessary to what is fairly suggested thereby.

With regard to the proposed combination of Stacey and Thanawala, appellant respectfully submits that the Examiner has somehow extracted a resistor R, capacitor C_P, and reactor L_D from FIGS. 9, 11, 13 and 15 of Thanawala while completely disregarding the fact that the circuits in the drawings are in fact connected *in series* with compensating capacitor C and with saturable reactor L of the electrical circuit (column 4, lines 34-41) so that the cumulative circuit is *shunted* across a device; that the series combination of C_D and L_D form a *series* resonant circuit (column 4, lines 39-41) as opposed to an alleged parallel combination of C_P and L_D as contended by the Examiner; and that other components are utilized in Thanawala so that the cumulative circuit functions as a damping circuit. Indeed, appellant respectfully submits that the Examiner not only has extracted components from the Thanawala devices while ignoring other components which are vital and necessary to the performance and appreciation of the Thanawala invention, but also modified the interrelationship of the extracted components (resistor R, capacitor C_P, and inductor L_D) to such an extent that the extracted components function and interrelate entirely contrary to that disclosed by Thanawala. As a result, appellant respectfully submits that the Examiner has improperly extracted components from Thanawala in rejecting claims 1-11 and 20-21 under 35 USC §103.

Significantly, concerning the Examiner's proposed combinations of teachings, appellant respectfully submits that the combination proposed by the Examiner is improper. First, obviousness cannot be established by combining teachings from relevant art to produce the claimed invention if there is no teaching, suggestion, or incentive supporting the combination. *ACS Hospital Systems, Inc. v. Montefiore Hospital et al.*, 221 USPQ 929, 933 (Fed. Cir. 1984). Moreover, references are not properly combinable if their intended function is destroyed. *In re Gordon*, 221 USPQ 1125 (Fed. Cir. 1984). Here, no teaching, suggestion or incentive exists in Stacey or Thanawala for combining the teachings of each or of combining the Stacey teachings with any alleged prior art. The primary object of Stacey is to provide an active device which actually *generates* a synthetic ripple current in order to offset ripple current existing in the electrical system under conditions of input frequency and passive component variations (column 3, lines 50-54; and column 4, lines 63-

68). Quite obviously, the Stacey device cannot function in this regard if its active element is replaced with a passive component such as a resistor. Thus no teaching, suggestion nor incentive exists in combining the teachings from Thanawala with the Stacey device or from Stacey with an alleged prior art. On the contrary, a *disincentive* actually exists in combining the teachings of each proposed combination, as the primary function of Stacey will be altogether destroyed thereby. Because the proposed combination of teachings wholly destroys the primary function of Stacey and in any absence of any teaching, suggestion or incentive to combine the above-identified references, Appellant respectfully submits that the Examiner has failed to establish prima facie obviousness of the invention claimed in claims 1-11 and 20-21.

In response to appellant's assertion that the primary function of Stacey is altogether destroyed by the Examiner's proposed combination, the Examiner responds that one would be motivated to replace the Stacey active components with a passive resistor as taught by Thanawala in order to filter unwanted frequencies (Paper No. 7, page 6). However, the Stacey device already minimizes unwanted frequencies and more, by generating synthetic ripple independent of variations in passive component values or source frequency. Why would an ordinary artisan be motivated to combine different teachings to result in a device which does no more than what one of the teachings individually provides?

Further, the Examiner contends that if inductor 62 and capacitor 60 of the Stacey device (FIG. 5) are precisely tuned to the ripple frequency, then the active elements of Stacey will not come into play, so somehow the intended function of Stacey is not destroyed by the proposed combination. By dealing in this "perfect world" context, appellant respectfully submits that the Examiner totally fails to consider any source frequency variation, which is precisely what the Stacey filter accounts for (column 4, lines 28-31 and lines 50-52), together with other real world situations such as electrical component value variation. When viewed from a real world perspective, the active components of the Stacey filter are entirely essential in order for the Stacey device to accomplish its intended function, and their omission wholly destroys the intended function thereof. Since the intended function of Stacey to eliminate ripple current under conditions of source frequency variation and component value variation is destroyed by the Examiner's proposed combination,

appellant respectfully submits that the Examiner has impermissibly combined the teachings of Stacey and Thanawala, and thereby failed to establish prima facie obviousness of the invention claimed in claims 1-11 and 20-21.

Appellant respectfully submits that no reference or combination thereof discloses or otherwise suggests a device for eliminating neutral currents in a multiple phase electrical system, comprising the parallel combination of three passive electrical components which are connected in series with a linear load and which are tuned to a harmonic frequency of the AC supply so as to eliminate a harmonic frequency of the supply frequency, as claimed in claim 1; or wherein the passive electrical components comprise a capacitor, reactor and resistor, as claimed in claims 3 and 4. This invention provides a significant improvement over the references relied upon by the Examiner because a purely passive implementation of a circuit which eliminates neutral currents is significantly less costly than a complex circuit utilizing a number of active components. As a result, appellant respectfully submits that the Examiner has failed to establish prima facie obviousness of the invention claimed in claims 1, 3 and 4.

Appellant respectfully submits that no reference cited by the Examiner discloses or otherwise suggests a device for eliminating neutral currents in a multiple phase electrical system, comprising the parallel combination of three passive electrical components which are connected in series with a nonlinear load, wherein the parallel combination of passive components is tuned to the third harmonic frequency, as recited in claim 2. The invention defined in claim 2 provides a significant improvement over prior devices in that it not only eliminates neutral currents pertaining to the third harmonic of the supply frequency, but it also acts to eliminate neutral currents pertaining to other harmonic frequencies as well. In an absence of any reference disclosing or suggesting the invention claimed in claim 2, applicant respectfully submits that the invention defined by claim 2 is nonobvious over the references cited by the Examiner.

Appellant respectfully submits that no reference relied upon by the Examiner or combination of references discloses or otherwise suggests a neutral current eliminating device comprising three separate circuits, each of which comprises the parallel combination of two or three passive electrical components which are connected along a separate phase

line and in series with a nonlinear load, wherein the two or three separate circuits are each tuned to an identical harmonic frequency of the supply frequency, as recited in claims 5 and 20, or wherein the two or three separate circuits are each tuned to the third harmonic frequency of the supply frequency, as recited in claims 6 and 21. The invention claimed in claims 5, 6, 20 and 21 provides a significant advantage over the references cited by the Examiner in that the claimed invention eliminates neutral currents which are contributed by each phase line in the electrical system so that substantially no currents are added in the neutral line. In an absence of any reference or combination thereof disclosing or suggesting the invention claimed in claims 5 and 6, appellant respectfully submits that the Examiner has failed to establish prima facie obviousness thereof.

No reference disclosed by the Examiner teaches, discloses or otherwise suggests a device for eliminating harmonic currents generated by a nonlinear load in an electrical system, *consisting* of a parallel combination of a first, second, and third passive electrical component, the parallel combination being connected in series with a nonlinear load and tuned to a harmonic frequency of the AC source, as recited in claim 7; wherein the parallel combination is tuned to a third harmonic of the AC source, as recited in claim 8; or wherein the first passive component is a resistor, the second passive component is a reactor, and the third passive component is a capacitor, as recited in claims 9 and 10. In sharp and distinct contrast, the Examiner relies upon the Stacey reference which discloses a *hybrid* device for a *linear* load primarily comprising *active* component(s) 28 (FIGS. 1 and 5); and the Thanawala reference which discloses various combinations of damping circuits which are connected *in series* with a compensating capacitor C and a saturable reactor L, the resulting circuit not only failing to disclose a parallel combination of three passive components but also failing to disclose a device which is connected in series with a load.

Appellant respectfully submits that the transitional phrase "consisting of" in a preamble of a claim is a closed limitation, as opposed to the transitional phrase "comprising" in a claim preamble. In this case, the Examiner freely admits that the prior art fails to disclose or suggest a device which is tuned "to filter a third harmonic using a parallel combination of a reactor, a resistor, and a capacitor." (Final Office Action, Paper No. 7, page 5). Clearly, in the absence of any reference or combination thereof which discloses a

device consisting solely of a parallel combination of three passive electrical components which is connected in series with a nonlinear load so as to reduce harmonic currents generated thereby and for the reasons stated hereinabove with respect to the Examiners rejection of claims 1-6, appellant respectfully submits that the Examiner has failed to establish prima facie obviousness of the invention claimed in claims 7-10. Accordingly, appellant respectfully requests that the rejection be overturned.

IV. Claims 12-19 stand rejected under 35 USC §103 as being unpatentable over the alleged acknowledged prior art in view of Stacey and Thanawala as applied to the rejection of claims 11, and further in view of Gilardi. In response thereto, appellant respectfully appeals the rejection based upon the reasons stated hereinabove as applied to the rejection of claims 1-11 under 35 USC §103 and upon the following.

Appellant respectfully submits that the proposed combination fails to disclose or otherwise suggest a device for reducing currents in an electrical system, including a means for connecting the nonlinear load to the claimed parallel connection of passive electrical components, comprising an equipment rack panel member with perforations for permitting airflow so that loads stored in the rack may be connected to the device, as recited in claim 12. This feature is a significant improvement because the device may be mounted in a conventional equipment rack in place of a cooling panel and connected to nonlinear loads without sacrificing equipment rack space. In a complete absence of any reference or combination of references which teach or otherwise suggest the invention claimed in claim 12, appellant respectfully submits that the Examiner has failed to establish prima facie obviousness of the claimed invention, and requests that the rejection thereto under 35 USC §103 be overturned.

In addition, the proposed combination fails to disclose or otherwise suggest a current reducing device including a connecting means having a bracket member for mounting the device along a planar surface so as to replace a conventional wall outlet and to connect to a nonlinear load, as claimed in claim 13. Such a device is significant and advantageous in allowing the protection circuitry to be substantially hidden and unobservable from view while allowing a convenient connection to the nonlinear load. In a complete absence of any

reference or combination of references which teach or otherwise suggest the invention claimed in claim 13, appellant respectfully submits that the Examiner has failed to establish prima facie obviousness of the claimed invention, and requests that the rejection thereto under 35 USC §103 be overturned.

The Examiner's proposed combination additionally fails to disclose or otherwise suggest a current reducing device including a connecting means comprising a mounting bracket member and an isolation transformer connected in series with the parallel connection of the three passive components, as recited in claim 15. Such a device is significant and advantageous in providing a device which connects to and protects substantially portable equipment, such as medical equipment transported on a utility cart. In an absence of any reference or combination of references which teach or otherwise suggest the invention claimed in claim 15, appellant respectfully submits that the Examiner has failed to establish prima facie obviousness of the claimed invention, and requests that the rejection thereto under 35 USC §103 be overturned.

Further, the combination proposed by the Examiner fails to disclose or otherwise suggest a device for reducing currents in an electrical system in which it is connected, including a monitor saver board, as recited in claim 14. The device claimed in claim 14 is distinct and advantageous in that the monitor saver board feature substantially reduces current in an electrical system which provides power to a computing means. In an absence of any reference or combination of references which teach or otherwise suggest the invention claimed in claim 14, appellant respectfully submits that the Examiner has failed to establish prima facie obviousness of the claimed invention, and requests that the rejection thereto under 35 USC §103 be overturned.

Still further, the proposed combination fails to disclose or otherwise suggest a device for reducing currents in an electrical system into which it is connected, including a current controlling means comprising a current limiting circuit, a circuit for detecting a rapid rise in current drawn by the load and a switch for automatically deactivating the current limiting circuit, as recited in amended claim 17; wherein the harmonic current limiter is tuned to a third harmonic, as recited in claim 18; or wherein the current limiting circuit maintains a maximum current level drawn by the loads to between 6 and 8 amps, as recited in claim 19.

The devices claimed in claims 17-19 provide a significant improvement by not only substantially eliminating harmonic currents but also reducing peak currents in the electrical system, thereby improving the operation of the electrical system and the fanout thereof. In an absence of any reference or combination of references which teach or otherwise suggest the invention claimed in claims 17-19, appellant respectfully submits that the Examiner has failed to establish prima facie obviousness of the claimed invention, and requests that the rejection thereto under 35 USC §103 be overturned.

CONCLUSION

Based upon the foregoing, appellant respectfully submits that the specification as well as claims 17-19 fully comply with the requirements imposed by 35 USC §112, first paragraph, as well known current limiting circuits and current sensing circuits are described in sufficient detail in the specification as to enable an ordinary artisan to make and use the invention claimed in claims 17-19. Claims 12-15 fully comply with the requirements of 35 USC §112, fourth paragraph, as each claim properly references a claim previously set forth in the application, specifies a further limitation of the subject matter thereof, and incorporates by reference all of the limitations of the claim from which it depends. Accordingly, appellant respectfully requests that the objection to the specification and rejection of claims 12-15 and 17-19 under 35 USC §112 be overturned.

Further, appellant respectfully submits that the Examiner has failed to establish prima facie obviousness of claims 1-11 and 20-21. No reference relied upon by the Examiner discloses the problems associated with neutral currents, much less a solution thereto. The Examiner has impermissibly extracted portions of both Stacey and Thanawala to the exclusion of portions which are necessary to the full appreciation of what is suggested to an artisan. The Examiner has misconstrued the function of each passive component which was extracted from Thanawala in rejecting claims 1-11 and 20-21. No teaching, suggestion or incentive exists to combine Stacey with Thanawala since the intended function of Stacey is wholly destroyed by the proposed combination. Accordingly, appellant respectfully requests that the rejection be overturned.

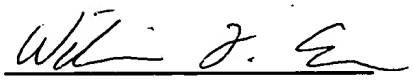
Appellant respectfully submits that the Examiner has failed to establish prima facie

obviousness of the invention claimed in claims 12-19. Accordingly, appellant respectfully requests that the rejection be overturned.

Appellant encloses herewith copies of the Brief on Appeal in triplicate. A check for $145.00 in payment of the filing fee is included herewith.

Favorable consideration and reversal of the final rejection is earnestly solicited.

Respectfully submitted,



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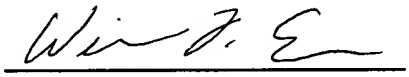

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APPENDIX OF CLAIMS

1. In a multiple phase electrical system for supplying power from an AC source to a plurality of nonlinear loads connected to at least one phase line therein, a device for substantially eliminating currents in the neutral wire, said device comprising:

a first electrical circuit comprising

a first passive electrical component connected along a phase line in said electrical system in series with at least one of said nonlinear loads,

a second passive electrical component connected in parallel to said first passive electrical component,

a third passive electrical component connected in parallel to said first and said second passive electrical components; and

wherein said first, said second, and said third passive electrical components of said first circuit are tuned to a harmonic frequency of a fundamental frequency of the AC source so as to substantially eliminate a harmonic current drawn by said at least one nonlinear load connected in series with said parallel connection of said first, said second, and said third passive electrical components.

2. A device as recited in claim 1, wherein:

said first, said second, and said third passive electrical components of said first electrical circuit are tuned to a third harmonic frequency of the AC source.

3. A device as recited in claim 1, wherein:

said first passive electrical component of said first electrical circuit comprises a capacitor;

said second passive electrical component of said first electrical circuit comprises a reactor; and

said third passive electrical component of said first electrical circuit comprises a resistor.

4. A device as recited in claim 2, wherein:

said first passive electrical component of said first electrical circuit comprises a capacitor;

said second passive electrical component of said first electrical circuit comprises a reactor; and

said third passive electrical component of said first electrical circuit comprises a resistor.

5. A neutral current eliminating device as recited in claim 1, wherein:

each phase line in the electrical system supplies power to at least one nonlinear load;

said device includes a second and third electrical circuit, each of said first, said second and said third electrical circuits being connected along a separate phase line in said electrical system in series with at least one nonlinear load whose power is supplied by said separate phase line, said first, said second and said third electrical circuits substantially eliminate a harmonic current in each of said separate phase lines drawn by said nonlinear loads;

said second electrical circuit comprises a fourth passive electrical component, a fifth passive electrical component connected in parallel to said fourth passive electrical component, and a sixth passive electrical component connected in parallel to said fourth and said fifth passive electrical components;

said third electrical circuit comprises a seventh passive electrical component, an eighth passive electrical component connected in parallel to said seventh passive electrical component, and a ninth passive electrical component connected in parallel to said eighth and said seventh passive electrical components; and

wherein each of said first, said second and said third electrical circuits is tuned to an identical harmonic frequency of the AC source.

6. A neutral current eliminating device as recited in claim 2, wherein:

each phase line in the electrical system supplies power to at least one nonlinear load;

said device includes a second and third electrical circuit, each of said first, said second and said third electrical circuits being connected along a separate phase line in said electrical system in series with at least one nonlinear load whose power is supplied by said separate phase line, said first, said second and said third electrical circuits substantially eliminate a harmonic current in each of said separate phase lines drawn by said nonlinear loads;

said second electrical circuit comprises a fourth passive electrical component, a fifth passive electrical component connected in parallel to said fourth passive electrical component, and a sixth passive electrical component connected in parallel to said fourth and said fifth passive electrical components;

said third electrical circuit comprises a seventh passive electrical component, an eighth passive electrical component connected in parallel to said seventh passive electrical component, and a ninth passive electrical component connected in parallel to said eighth and said seventh passive electrical components; and

wherein each of said first, said second and said third electrical circuits is tuned to a third harmonic of the AC source.

7. A device for substantially eliminating a harmonic current generated by a nonlinear load in an electrical distribution system, the distribution system distributing power from an AC source, said device consisting of:

a first passive electrical component connected in series with the nonlinear load;

a second passive electrical component connected in parallel to said first passive electrical component;

a third passive electrical component connected in parallel to said first and said second passive electrical components; and

wherein said first, said second, and said third passive electrical components are tuned to a harmonic frequency of the AC source so as to change the current drawn by the nonlinear load.

8. A device as recited in claim 7, wherein:

said device is tuned to a third harmonic frequency of the AC source.

9. A device as recited in claim 7, wherein:

said first passive electrical component is a resistor;

said second passive electrical component is a reactor; and

said third passive electrical component is a capacitor.

10. A device as recited in claim 8, wherein:

said first passive electrical component is a resistor;

said second passive electrical component is a reactor; and

said third passive electrical component is a capacitor.

11. A device for reducing currents in an electrical system which supplies power to a nonlinear load from an AC source, comprising:

a first passive electrical component connected in series with the nonlinear load;

a second passive electrical component connected in parallel to said first passive electrical component;

a third passive electrical component connected in parallel to said first and said second passive electrical component;

a housing member for said first, said second, and said third passive electrical components;

means for connecting the nonlinear load to said parallel connection of said first, said second and said third passive electrical components; and

wherein said first, said second, and said third passive electrical components are tuned to a third harmonic frequency of the AC source so as to substantially alter current drawn by the nonlinear load.

12. A device as recited in claim 11, wherein:

said connecting means includes an equipment rack panel member connected to said housing so as to mount said housing in an equipment rack storing the nonlinear load; and

wherein said equipment rack panel member is substantially perforated so as to allow airflow to pass therethrough.

13. A device as recited in claim 11, wherein:

said connecting means includes at least one electrical socket for connecting to the nonlinear load, said socket being disposed along a first surface of said housing member, and at least one bracket member for mounting said device along a substantially planar surface so that said socket and said first surface of said housing member are substantially aligned with said planar surface, said device substantially replacing a conventional wall outlet.

14. A device as recited in claim 11, wherein:

the nonlinear load comprises a computer having a monitor connected thereto; and

said device further includes at least one monitor saver board, said monitor saver board deactivates said monitor during periods of nonuse, and a housing member having electrical connectors for connection to said monitor and to said computer.

15. A device as recited in claim 11, further including:

an isolation transformer connected between said AC source and said parallel connection of said first, said second, and said third passive electrical components;

wherein said connecting means includes electrical sockets extending therefrom for providing connection to the nonlinear load, and at least one bracket member for attaching said housing member to a utility cart.

17. A device as recited in claim 11, including:

means, connected in series with said parallel connection of said first, said second, and said third passive electrical components, for controlling current levels drawn by the nonlinear load, comprising a current limiting circuit, a circuit for detecting a rapid rise in current drawn by the nonlinear load and a switch for automatically deactivating said clamping circuit based upon signal levels detected by said current detecting circuit.

18. A device as recited in claim 17, wherein:

said first, said second, and said third electrical components are tuned to a third harmonic frequency of the AC source.

19. A device as recited in claim 18, wherein:

said current level limiting circuit maintains a maximum current level drawn by the nonlinear load to between approximately 6 and 8 amps.

20. A device as recited in claim 1, wherein:

each phase line in the electrical system supplies power to at least one nonlinear load;

said device includes a second electrical circuit, each of said first and said second electrical circuits being connected along a separate phase line therein in said electrical system and in series with at least one nonlinear load whose power is supplied by said separate phase line, said first and said second electrical circuits substantially eliminate a harmonic current in each of said separate phase lines drawn by said nonlinear loads;

said second electrical circuit comprises a fourth passive electrical component, a fifth passive electrical component connected in parallel to said fourth passive electrical component, and a sixth passive electrical component connected in parallel to said fourth and said fifth passive electrical components;

wherein each of said first and said second electrical circuits is tuned to an identical harmonic frequency of the AC source.

21. A device as recited in claim 1, wherein:

each phase line in the electrical system supplies power to at least one nonlinear load;

said device includes a second electrical circuit, each of said first and said second electrical circuits being connected along a separate phase line therein in said electrical system and in series with at least one nonlinear load whose power is supplied by said separate phase line, said first and said second electrical circuits substantially eliminate a harmonic current in each of said separate phase lines drawn by said nonlinear loads;

said second electrical circuit comprises a fourth passive electrical component, a fifth passive electrical component connected in parallel to said fourth passive electrical component, and a sixth passive electrical component connected in parallel to said fourth and said fifth passive electrical components;

wherein each of said first and said second electrical circuits is tuned to a third harmonic frequency of the AC source.